

WHAT IS CLAIMED IS:

1. An information processing apparatus comprising:

attribute input means for inputting attribute information for a 3D model;

attribute arrangement plane setting means for setting an attribute arrangement plane being a virtual plane with which said attribute information is associated;

storage means for storing said attribute information in association with said attribute arrangement plane;

frame setting means for setting a frame indicating existence of said attribute arrangement plane;

frame name setting means for placing a name of said attribute arrangement plane on said frame; and

arranging means for, when there exist a plurality of said attribute arrangement planes on the occasion of displaying said attribute information on display means,

arranging names of said attribute arrangement planes so as to avoid overlap of the names on the display means.

2. The information processing apparatus according to Claim 1, wherein said arranging means enlarges or reduces each of areas of said plurality of frames, thereby arranging the names so as to avoid the overlap thereof.

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3. The information processing apparatus according to Claim 1, wherein said arranging means defines as a reference an area of a frame displayed at a foremost position on the display means out of said plurality of attribute arrangement planes, and

5 effects enlargement of the areas of said frames except for the frame of said reference according to an order along a direction from the front side toward the rear side on the display means.

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4. The information processing apparatus according to Claim 3, wherein the areas of said frames are rectangular and wherein the enlargement of the areas of the frames for said attribute arrangement planes is to 15 enlarge the areas of said plurality of frames into substantially similar shapes while placing a reference point at a vertex out of four vertexes of the frame as said reference and fixing vertexes of the respective frames corresponding to said reference point.

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5. The information processing apparatus according to Claim 1, wherein said arranging means defines as an object for change of setting, every frame within a predetermined angular range with respect to a plane 25 perpendicular to a visual axis direction of said display means.

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6. The information processing apparatus according to Claim 5, wherein said predetermined angular range can be arbitrarily set by an operator.

5 7. The information processing apparatus according to Claim 1, wherein said arranging means defines as an object every frame set in parallel with a certain frame selected by an operator.

10 8. The information processing apparatus according to Claim 1, wherein said arranging means is executed in a state in which said 3D model is stationary.

15 9. The information processing apparatus according to Claim 1, wherein there exist a plurality of frames for said attribute arrangement planes and wherein when change of areas of said frames brings the areas of said frames to an exterior of said display means, a display magnification is changed so as to display the areas of 20 all the frames as objects within said display means.

10. An information processing method comprising:
an attribute input step of inputting attribute information for a 3D model;
25 an attribute arrangement plane setting step of setting an attribute arrangement plane being a virtual plane with which said attribute information is

associated;

 a storage step of storing said attribute information in association with said attribute arrangement plane;

5 a frame setting step of setting a frame indicating existence of said attribute arrangement plane;

 a frame name setting step of placing a name of said attribute arrangement plane on said frame; and

10 an arranging step of, when there exist a plurality of said attribute arrangement planes on the occasion of displaying said attribute information on display means, arranging names of said attribute arrangement planes so as to avoid overlap of the names on the display means.

15 11. A computer executable program product comprising:

 code for inputting attribute information for a 3D model;

20 code for setting an attribute arrangement plane being a virtual plane with which said attribute information is associated;

 code for storing said attribute information in association with said attribute arrangement plane;

25 code for setting a frame indicating existence of said attribute arrangement plane;

 code for placing a name of said attribute arrangement plane on said frame; and

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code for, when there exist a plurality of said
attribute arrangement planes on the occasion of
displaying said attribute information on display means,
arranging names of said attribute arrangement planes so
5 as to avoid overlap of the names on the display means.

12. An information processing apparatus
comprising:

10 attribute input means for inputting attribute
information for a 3D model;

15 attribute arrangement plane setting means for
setting an attribute arrangement plane being a virtual
plane with which said attribute information is
associated;

20 storage means for storing said attribute
information in association with said attribute
arrangement plane; and

first frame setting means for setting a first
frame so as to surround a range of the attribute
25 information associated with said attribute arrangement
plane.

13. The information processing apparatus
according to Claim 12, further comprising:

25 second frame setting means for setting a second
frame indicating existence of said attribute
arrangement plane.

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14. An information processing method comprising:
an attribute input step of inputting attribute
information for a 3D model;
an attribute arrangement plane setting step of
5 setting an attribute arrangement plane being a virtual
plane with which said attribute information is
associated;
a storage step of storing said attribute
information in association with said attribute
10 arrangement plane; and
a first frame setting step of setting a first
frame so as to surround a range of the attribute
information associated with said attribute arrangement
plane.

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15. A computer executable program product
comprising:
code for inputting attribute information for a 3D
model;
20 code for setting an attribute arrangement plane
being a virtual plane with which said attribute
information is associated;
code for storing said attribute information in
association with said attribute arrangement plane; and
25 code for setting a first frame so as to surround a
range of the attribute information associated with said
attribute arrangement plane.

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16. An information processing apparatus comprising:

visual axis setting means for defining an arbitrary visual axis direction and view point for a 3D model;

attribute input means for inputting attribute information corresponding to the visual axis direction set by said setting means;

storage means for storing said visual axis direction and said attribute information in association with each other;

specifying means for specifying said set visual axis direction;

display means for displaying the attribute information corresponding to the visual axis direction specified by said specifying means; and

display control means for switching a display method of an arbitrary range.

20 17. The information processing apparatus according to Claim 16, further comprising:

grouping means for grouping a plurality of attribute information inputted by said attribute input means; and

25 storage control means for storing the grouped attribute information and the visual axis direction set by said visual axis setting means, in association with

each other in said storage means.

18. The information processing apparatus
according to Claim 17, wherein said storage control
5 means stores a plurality of different attribute
information for an identical visual axis direction in
association with each other.

19. The information processing apparatus
10 according to Claim 18, wherein said visual axis setting
means sets different positions on the identical visual
axis direction and said storage control means stores
attribute information at the different positions on the
identical visual axis direction in association with
15 each other.

20. The information processing apparatus
according to Claim 16, wherein said display control
means makes a shape of every area displayed in a
20 different display method except for a shape of an area
between the different positions on the identical visual
axis direction, set by said visual axis setting means.

21. The information processing apparatus
25 according to Claim 16, wherein said display control
means makes every shape displayed in a different
display method except for a shape to which the

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attribute information associated with said visual axis direction is added.

22. An information processing apparatus
5 comprising:

visual axis setting means for defining an arbitrary visual axis direction and view point for a 3D model;

10 attribute input means for inputting attribute information corresponding to the visual axis direction set by said setting means;

storage means for storing said visual axis direction and said attribute information in association with each other;

15 specifying means for specifying said set visual axis direction;

display means for displaying the attribute information corresponding to the visual axis direction specified by said specifying means; and

20 cross section position display means for, when a position set by said visual axis setting means is located at a position indicating a cross section of the 3D model, explicitly showing said position.

25 23. The information processing apparatus according to Claim 22, further comprising:

grouping means for grouping a plurality of

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attribute information inputted by said attribute input means; and

storage control means for storing the grouped attribute information and the visual axis direction set by said visual axis setting means, in association with each other in said storage means.

24. The information processing apparatus according to Claim 23, wherein said storage control means stores a plurality of different attribute information for an identical visual axis direction in association with each other.

25. The information processing apparatus according to Claim 24, wherein said visual axis setting means sets different positions on the identical visual axis direction and said storage control means stores attribute information at the different positions on the identical visual axis direction in association with each other.

26. The information processing apparatus according to Claim 22, wherein said display control means makes a shape of every area displayed in a different display method except for a shape of an area between the different positions on the identical visual axis direction, set by said visual axis setting means.

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27. The information processing apparatus according to Claim 22, wherein said display control means makes every shape displayed in a different display method except for a shape to which the 5 attribute information associated with said visual axis direction is added.

28. An information processing apparatus comprising:
10 visual axis setting means for defining an arbitrary visual axis direction and view point for a 3D model;
15 attribute input means for inputting attribute information corresponding to the visual axis direction set by said setting means;
20 storage means for storing said visual axis direction and said attribute information in association with each other;
25 specifying means for specifying said set visual axis direction;
30 display means for displaying the attribute information corresponding to the visual axis direction specified by said specifying means; and
35 visual axis display means for, when a position set by said visual axis setting means is located at a position indicating a cross section of the 3D model, explicitly showing the visual axis direction.

29. The information processing apparatus according to Claim 28, further comprising:

grouping means for grouping a plurality of attribute information inputted by said attribute input

5 means; and

storage control means for storing the grouped attribute information and the visual axis direction set by said visual axis setting means, in association with each other in said storage means.

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30. The information processing apparatus according to Claim 29, wherein said storage control means stores a plurality of different attribute information for an identical visual axis direction in association with each other.

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31. The information processing apparatus according to Claim 30, wherein said visual axis setting means sets different positions on the identical visual axis direction and said storage control means stores attribute information at the different positions on the identical visual axis direction in association with each other.

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25 32. The information processing apparatus according to Claim 28, wherein said display control means makes a shape of every area displayed in a

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different display method except for a shape of an area between the different positions on the identical visual axis direction, set by said visual axis setting means.

5 33. The information processing apparatus according to Claim 28, wherein said display control means makes every shape displayed in a different display method except for a shape to which the attribute information associated with said visual axis direction is added.

10 34. An information processing method comprising: a three-dimensional data preparing step of preparing data of an article having a three-dimensional shape;

15 a visual axis setting step of defining an arbitrary visual axis direction and view point for a 3D model;

20 an attribute input step of inputting attribute information corresponding to the visual axis direction set in said setting step;

25 a storage step of storing said visual axis direction and said attribute information in association with each other;

30 a specifying step of specifying said set visual axis direction;

35 a display step of displaying the attribute

information corresponding to the visual axis direction specified in said specifying step; and

 a display control step of switching a display method of an arbitrary range.

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35. An information processing method comprising:
 a visual axis setting step of defining an arbitrary visual axis direction and view point for a 3D model;

10 an attribute input step of inputting attribute information corresponding to the visual axis direction set in said setting step;

 a storage step of storing said visual axis direction and said attribute information in association 15 with each other;

 a specifying step of specifying said set visual axis direction;

20 a display step of displaying the attribute information corresponding to the visual axis direction specified in said specifying step; and

 a cross section position display step of, when a position set in said visual axis setting step is located at a position indicating a cross section of the 3D model, explicitly showing said position.

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36. An information processing method comprising:
 a visual axis setting step of defining an

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arbitrary visual axis direction and view point for a 3D model;

an attribute input step of inputting attribute information corresponding to the visual axis direction

5 set in said setting step;

a storage step of storing said visual axis direction and said attribute information in association with each other;

10 axis direction;

a display step of displaying the attribute information corresponding to the visual axis direction specified in said specifying step; and

15 a visual axis display step of, when a position set
in said visual axis setting step is located at a
position indicating a cross section of the 3D model,
explicitly showing the visual axis direction.

37. A computer executable program product

code for preparing data of an article having a three-dimensional shape:

code for defining an arbitrary visual axis direction and view point for a 3D model:

25 code for inputting attribute information
corresponding to said defined visual axis direc-

code for storing said visual axis direction and

said attribute information in association with each other;

code for specifying said defined visual axis direction;

5 code for displaying the attribute information
corresponding to said specified visual axis direction;
and

code for switching a display method of an arbitrary range.

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38. A computer executable program product comprising:

code for defining an arbitrary visual axis direction and view point for a 3D model:

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code for inputting attribute information corresponding to said defined visual axis direction:

code for storing said visual axis direction and said attribute information in association with each other;

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code for specifying said defined visual axis direction;

code for displaying the attribute information corresponding to said specified visual axis direction and

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code for, when a position defined in said code for defining the arbitrary visual axis direction and view point for the 3D model is located at a position

indicating a cross section of the 3D model, explicitly showing said position.

39. A computer executable program product
5 comprising:

code for defining an arbitrary visual axis direction and view point for a 3D model;

code for inputting attribute information corresponding to said defined visual axis direction;

10 code for storing said visual axis direction and said attribute information in association with each other;

code for specifying said defined visual axis direction;

15 code for displaying the attribute information corresponding to said specified visual axis direction; and

20 code for, when a position defined in code for defining the arbitrary visual axis direction and view point for the 3D model is located at a position indicating a cross section of the 3D model, explicitly showing the visual axis direction.

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